



CHAPTER VI PAVEMENT STRUCTURE DESIGN

SECTION 6-07

BITUMINOUS CONSTRUCTION MATERIALS

- 6-07.1 GENERAL.** To promote uniformity in design and to expedite the checking of quantities, the estimate factors given in [Figure 6-07.1](#) should be used to compute quantities for bases, flexible type pavements, seal coats, etc., unless local conditions indicate more desirable results can be obtained with other estimate factors. The factors given in [Figure 6-07.1](#) have generally provided good results. Projects financed with maintenance funds should be prepared in strict conformity with the instructions set forth in [Subsection 6-06.3](#). Care should be exercised when setting up small quantities of materials. It may be more advantageous to combine types of materials. Coordination with the district materials engineer is required prior to combining.
- 6-07.2 ITEM 301 - PLANT MIX BITUMINOUS BASE COURSE.** The grade of asphalt cement to be specified in the contract will be furnished by the district materials engineer upon request by the designer. Mineral aggregate-gradation requirements are set forth in the standard specifications.
- 6-07.3 ITEM 401 - PLANT MIX BITUMINOUS PAVEMENT.** The grade of asphalt cement to be specified in the contract will be furnished by the district materials engineer upon request by the designer. Mineral aggregate-gradation BP-1 is specified unless directed otherwise by the district materials engineer. Plant mix bituminous pavement shall be used on all light duty pavements with an ADT of less than 1700.
- 6-07.4 ITEM 402 - PLANT MIX BITUMINOUS SURFACE LEVELING.** This item is reserved exclusively for use by the Maintenance and Traffic Division for that work previously designated as maintenance leveling course and previously included in the contract by special provision. Districts do not specify this item unless so advised by the Maintenance and Traffic Division or unless specific approval is obtained from the Design Division for other work.
- 6-07.5 ITEM 403 - ASPHALTIC CONCRETE PAVEMENT.** The use of a commercial mixture of asphaltic concrete is not permitted. Types IB and IC pavements shall be used on all pavements with an ADT of greater than 1700.

Special 403 surfacing mixes, e.g. limestone-porphry, limestone-steel slag, etc., are substituted for the Type IC mix when a mixture with higher friction properties is needed, such as in high speed urban congested areas or where the project accident rate exceeds the statewide accident rate for the last 5-year period and the wet to dry accident ratio is 1:3 or greater. Stone Mastic Asphalt (SMA) should be used in lieu of limestone-porphry and limestone-steel slag asphaltic concrete mixtures on route shown within the COMMERCIAL ZONE LIMITS FOR ALL ROUTES OTHER THAN INTERSTATES and COMMERCIAL ZONE LIMITS FOR INTERSTATE AND ST. JOSEPH on the MISSOURI VEHICLE ROUTE MAP 1995-1996. The district should show SMA on the plans and should include in their index of job special provisions the title "Stone Mastic Asphalt" with the notation "To be inserted by the Design Division".

Milling is the preferred method of leveling, however Type IC asphaltic concrete may be used for spot wedging and for leveling course as per the standard specifications providing the minimum thickness is 25 mm. The grade of asphalt cement to be specified in the contract will be furnished by the district materials engineer upon request by the designer. Mineral aggregate-gradation requirements are set forth in the standard specifications for the respective type of mixture.

- 6-07.5 (1) AUTOMATIC SCREED CONTROL OR ESTABLISHED GRADE REFERENCE.** The standard specifications require the use of automatic screed controls with the sensor following a traveling reference plane. In some instances, such as a badly warped pavement or very poor riding condition, the use of an established grade reference may be desirable. If the established grade reference is desired, a special provision must be included in the contract requiring its use for the initial pass of the paver when placing the first continuous layer. The special provision may be modified to require the established grade reference for a portion of a project if necessary.

- 6-07.5 (2) TEST STRIPS.** A separate bituminous test strip is provided for each Type IB or IC mixture consisting of 2000 Mg (2000 tons) or more. The district will include in their index of job special provisions the title "Bituminous Test Strip - IB and IC Asphalt Concrete Mix" with the notation "To be inserted by Design Division."
- 6-07.6 ITEM 405 - ROAD MIX BITUMINOUS PAVEMENT.** Maximum recommended total thickness is 50 mm (2 in.). Liquid Asphalt MC-800 is specified unless directed otherwise by the district materials engineer. Consideration should be given to the grade of aggregate which can be obtained most economically in the area of the proposed project. Grade G is specified if no other grade is preferred. Road mix bituminous pavement is set up for processing by the kilometer (mile) unless the surface is composed of irregularly shaped areas. For this condition, it may be paid for by the square meter (square yard) with a special provision indicating payment as a complete product in place.
- 6-07.7 ITEM 407 - TACK COAT.** This item is used for impervious surfaces such as portland cement concrete, asphaltic concrete or bituminous surfaces prior to resurfacing. The grade of emulsified asphalt is selected by the contractor.
- 6-07.8 ITEM 408 - PRIME COAT.** This item is used for previous surfaces such as earth, aggregate base or cement treated base over which a seal coat or bituminous mixture other than plant mix bituminous base is to be placed. Primer is not used for plant mix bituminous base with a thickness of 100 mm (4 in.) or more. Generally use RC-70 or MC-30 liquid asphalt. If it is necessary to handle traffic over the prime coat, sanding primer is provided.
- 6-07.9 ITEM 409 - SEAL COAT.** This item is for non-maintenance projects only. A seal coat placed on a previous surface such as an aggregate base should have a prime coat as mentioned above. The type of bituminous material and grade of liquid asphalt is selected by the contractor. The grade of emulsified asphalt will be designated by the engineer after examination of the aggregate the contractor proposes to furnish. Aggregate Grade #5 or 7 is used. Grades 1, 2 and 3 are considered too large and coarse for the department's present seal coat applications.
- 6-07.10 ITEM 411 - UNDERSEALING PAVEMENT.** Asphalt should not be used for undersealing. A cement - fly ash-water grout mixture is preferred for undersealing. The district will include in their index of job special provisions the title "Undersealing Pavement by Pressure Grouting" with the notation "To be inserted by Design Division."
- 6-07.11 COMMERCIAL MIXTURES.** The standard specifications permit the use of approved commercial mixture for plant mix bituminous pavement and plant mix bituminous base course when so specified in the contract. Commercial mixtures are not permitted for asphaltic concrete. Care should be exercised when setting up small quantities of asphaltic concrete in that it may be more desirable, all factors considered, to use plant mix bituminous pavement so that a commercial mixture can be permitted.
- 6-07.12 SHOULDER SURFACES.** For projects having shoulder stabilization only and no resurfacing of traveled way, specify plant mix bituminous pavement. For all projects requiring surfacing of the traveled way, specify Type IC for shoulders. If a special 403 asphaltic concrete is to be used on the traveled way, that special 403 asphaltic concrete should be considered to be used on the shoulder. Consult the materials engineer for guidance on use of special 403 asphaltic concrete mixtures on shoulders.